**BOARD OF FORESTRY AND FIRE PROTECTION**
P.O. Box 944246
SACRAMENTO, CA 94244-2460
Website: www.bof.fire.ca.gov
(916) 653-8007

September 29, 2008

**Re: Announcement of the Technical Expert Forum for the "Scientific Literature Review on Forest Management Effects on Riparian Function for Anadromous Salmonids"**

Dear Stakeholder:

The State Board of Forestry and Fire Protection (Board) is holding a Technical Expert Forum (TEF) to discuss the findings of the "Scientific Literature Review on Forest Management Effects on Riparian Function for Anadromous Salmonids". The literature review and the TEF are supporting the Board's review of the California Forest Practice Rules for watersheds with anadromous salmonid species, termed the "Threatened or Impaired Watershed Rules".

The TEF will feature presentations and discussions on the findings of the literature review from world-renowned science experts, the Board's Technical Advisory Committee, and Sound Watershed Consulting, the contractor who prepared the literature review. See the attached meeting agenda, list of attending experts, and details on the TEF.

**Meeting Date and Time:** October 23, 2008, 9:00 am. to 4:00 pm.

**Meeting Location**: Resources Building, 1st Floor Auditorium, 1416 Ninth Street, Sacramento, CA 95814

**Request for Public Questions for Experts by October 15th:** The TEF will include experts discussing questions from the Board and the public in a "round table" setting. You are invited to submit questions for consideration by the experts in advance of the meeting. The questions should be related to the literature review process, the literature review science findings, and conclusion in the report. Please submit your questions to the Board by October 15th.

The completed literature will can be view at: http://www.soundwatershed.com/BOF.htm
Background information on the literature view and TEF can be found at: http://www.fire.ca.gov/CDFBOFDB/board/board_proposed_rule_packages.aspx . (See Threatened or Impaired Watersheds (T/I) Literature Review). For further information please contact me or our Regulation Coordinator, Chris Zimny, at (916) 653 9418, cell (916) 712 7329, or email chris.zimny@fire,ca,gov.

Sincerely,

George Gentry
Executive Officer

**Agenda**
**Technical Expert Forum (TEF)**

**Scientific Literature Review on Forest Management Effects on Riparian Function for Anadromous Salmonids**

Thursday October 23, 2008, 9:00 am to 4:00 pm
Facilitator: Gary Nakamura, Board member and TAC Chair

1) Overview of agenda for meeting, TEF purpose, and Sound Watershed Consulting (SWC) literature review products (9:00 to 9:15 am)

2) Introduction of scientists central to TEF: SWC, Board's Technical Advisory Committee (TAC) and Invited Science Experts. (9:15 to 9:30 am)

3) Presentations from Technical Advisory Committee (TAC) (9:30 to 10:30 am)

Break

4) Presentations from Science Experts (11:00 am to 12:00 pm)

Lunch

5) Presentations from Science Experts (continued) (1:00 pm to 2:00 pm)

Break

6) Expert Round Table: Discussion of Questions from Board members and public (2:30 – 3:30 pm)

7) Public comments (3:30 to 4:00)

8) Staff close-out /next steps/ adjourn

## Attending Science Experts

**Dr. Lee Benda,** Research Scientist, Earth Systems Institute, Mt. Shasta, California. Dr. Benda's focus is watershed morphology and sedimentology and studying the dynamic interactions between terrestrial and riverine landscapes. Dr. Benda has been a leader in the development of interdisciplinary analytical tools and watershed analysis methods that can be used to investigate the naturally dynamic behavior of watersheds and human's interaction within it.

**Dr. Robert Beschta**, Certified Professional Hydrologist and Professor Emeritus, Oregon State University, Corvallis, Oregon. Dr. Beschta's has research interests in hydrologic effects of forest and rangeland uses, water quality, stream temperatures, riparian area management, channel morphology, and restoration of riparian ecosystems.

**Dr. George Ice**, National Council on Air and Stream Improvement Inc, Corvallis Oregon. The National Council for Air and Stream Improvement is an independent, non-profit research institute that focuses on environmental topics of interest to the forest products industry. Dr Ice is a principal scientist and program manager for NCASI. He is currently involved in forest riparian research in Minnesota, Texas, Oregon, and Idaho.

**Dr. Thomas Lisle**, Research Hydrologist, U. S. Forest Service Pacific Southwest Research Station, Redwood Sciences Laboratory, Arcata, California. Dr. Lisle is the team leader for project and programs on cumulative effects of forest management on hillslope processes, fisheries resources and downstream environments.

**Dr. Lee MacDonald**, Professor, Department of Forest, Rangeland and Watershed Stewardship, Warner College of Natural Resources, Colorado State University, Ft. Collins, Colorado. Dr. MacDonald's research focuses on the effects of forest management, fire, and roads on runoff, erosion, sediment yields, and stream channel characteristics . He is widely published and has achieved national and international recognition for his work throughout the U.S., Europe, Asia, and the Pacific. He has strong ties to California achieving his B.S. at Stanford, Ph.D. at U.C. Berkeley, and has been working on erosion and sediment delivery issues in the Sierra Nevada.

**Dr. Mary Ann Madej**, Research Geologist, US Geological Survey, Western Ecological Research Center, Redwood Field Station, Arcata, California. Dr. Madej is currently station leader conducting studies on geomorphic effects of floods, redwood regeneration in disturbed riparian zones, slope stability analysis, stream temperature monitoring, the effectiveness of road restoration techniques, as well as continuing work on sediment transport and channel monitoring. Dr. Madej is also in Adjunct Professor at Humboldt State University.

**Dr. Gordie Reeves**, Research Fish Biologist, Aquatic and Land Interaction Program, USDA Forest Service, Forestry Sciences Laboratory, PNW Research Station, Corvallis, Oregon. Dr. Reeves's research focuses on the impact of land management practices in juvenile anadromous salmonid and trout freshwater habitats, dynamics of aquatic ecosystems and the role of disturbances, and development of monitoring plan. He has participated in several efforts that evaluated options for managing federal lands in the Pacific Northwest and Alaska and was co-leader of the aquatic group of FEMAT. Dr. Reeves is also a courtesy professor at Oregon State University and Humboldt State University.

## TAC members:

**Ms. Charlotte Ambrose**, Biologist, National Marine Fisheries Service, Santa Rosa. Ms. Ambrose is the North Central California Coast Recovery Domain Coordinator and is responsible for the development of federal recovery plans for chinook, coho salmon and steelhead. She is currently the NMFS liaison to the Board of Forestry and has been working on forestry issues for NMFS since 1999.

**Mr. Curt Babcock,** Senior Environmental Scientist, California Department of Fish and Game, Redding. Mr. Babcock is the Supervisor of the Northern Region Timberland Conservation Program.

**Mr. Pete Cafferata,** Forest Hydrologist, California Department of Forestry and Fire Protection, Sacramento. Mr. Cafferata, a Registered Professional Forester, is the lead staff person for the Board of Forestry and Fire Protection's Monitoring Study Group, which has developed several programs to evaluate the effects of timber operations on water quality in California.

**Dr. Ken Cummins,** Professor Fishery Biology, Humboldt State University, Arcata. Dr. Cummins is the Co-Director, Institute for River Ecosystems, and Senior Advisory Scientist for the California Cooperative Fishery Research Unit.

**Dr. Brian Dietterick,** Professor Hydrology and Watershed Management, California Poly State University, San Luis Obispo. Dr. Dietterick is the Director of the Swanton Pacific Ranch of the College of Agriculture and Natural Resources.

**Dr. Cajun James,** Principal Research Scientist for Sierra Pacific Industries, Whitmore. Dr. James is conducting long-term watershed research studies in the Sierra Nevada and Southern Cascades to determine the effectiveness of different riparian buffer characteristics on biological diversity, near stream microclimate, and water quality.

**Mr. Gaylon Lee,** Senior Engineering Geologist, State Water Resources Control Board, Sacramento. Mr. Lee is the SWRCB liaison for forest and rangeland practices, and has worked on forestry issues since 1986. He led initiation of the State's program to monitor implementation and effectiveness of non-Federal forest practices.

**Mr. Gary Nakamura, TAC Chair,** Forestry Specialist, University of California Cooperative Extension, Redding. Mr. Nakamura is Co-Director of the UC Center for Forestry, which serves forest landowners, professional foresters and resource managers, teachers, students, and interested publics with an array of forestry education programs. Mr. Nakamura is Registered Professional Forester.

**Dr. Sari Sommarstrom,** Watershed Scientist, Sari Sommarstrom & Associates, Etna. Dr. Sommarstrom has consulted on a variety of watershed subjects since 1976, with one specialty being in sediment-related effects and mitigations.

**Dr. Kate Sullivan,** Manager of Hydrology and Aquatic Sciences, Humboldt Redwood Company, Scotia. Dr. Sullivan leads the watershed science and monitoring programs on Humboldt Redwood Company lands in Northern California.

**Dr. William Trush**, CEO and Senior Ecologist, McBain & Trush Inc., Arcata. Dr. Trush is an adjunct professor to the Humboldt State University Fisheries Department, directs a stream restoration plan for Los Angeles Department of Water and Power, and is a member of the County of Humboldt Extraction Review Team.

**Dr. Michael Wopat ,** Senior Engineering Geologist, California Geological Survey, Redding. State-registered Professional Geologist, State-Certified Hydrologist and Engineering Geologist (CEG). Dr. Wopat has been the CGS member of the Redding Inter-Agency THP Review Team since 1999, focusing mainly on issues related to geomorphology (mass movement and erosion) and hydrology.

**Mr. Christopher Zimny,** TAC staff, Sacramento**.** Mr. Zimny is the Regulations Coordinator for the California Department of Forestry and Fire and is a staff person for the Board of Forestry and Fire Protection .

## Sound Watershed Consulting

**Mike Liquori, MS, CEG - PROJECT MANAGER, Principal, Sound Watershed Consulting**. Mike Liquori has over 14 years of professional experience as a forest watershed geomorphologist and hydrologist with a primary focus on watershed ecology and stream corridor restoration. He has extensive knowledge of the management of forest riparian landscapes, and has had responsibilities for directing watershed management on over 860,000 acres of private forestlands in California, Washington and Oregon. He has chaired or participated on several scientific technical committees in support of forest policy objectives. He has applied his multi-disciplinary expertise to resolve management challenges associated with state-wide forest policy (Washington's Forests & Fish Plan), non-industrial private forests (Washington Rural Technology Initiative), watershed management strategies for several large industrial forestland owners, sustainable forestry audits (SFI), habitat conservation plans and restoration projects. Mr. Liquori has instructed in Forest & Fisheries Interactions, River Ecology and Wildland Hydrology at the University of Washington.

**Doug Martin, PhD , Principal, Martin Environmental.** Dr. Martin is a fisheries biologist with extensive multi-disciplinary experience in forest management all along the Pacific region. He has been an active co-chair of the Washington State Forest Practice Board's Cooperative Monitoring, Evaluation & Research Committee since 2000, where he has lead state-wide adaptive management programs addressing the impacts of forestry on clean water and salmonid habitats. Dr. Martin was a key scientific advisor to the Washington State Forest & Fish Plan. He has been a principal investigator for several long-term research programs in Alaska and Washington State addressing the use and application of riparian buffers in forestry.

**Bob Coats, PhD, Principal, Hydroikos & Adjunct Research Professor, UC Davis**. Dr. Coats has 35 years of experience focusing on the hydrologic and ecological effects of land management on aquatic ecosystems. This work has concentrated in two areas: wetlands and forested watersheds. In both areas, he has drawn on his background in hydrology, ecology, and soil science. His long-term research interests are focused on nitrogen cycling and biogeochemistry at the watershed level. In the area of forested watersheds, his experience includes research on the effects of land disturbance on water quality; evaluation of the effects of silvicultural activities on both site quality and water quality; review of proposed timber harvest plans and National Forest plans; reclamation and hydrologic aspects of strip mining in arid lands; evaluating the hydrologic and water quality effects of hydropower projects; and developing monitoring programs and habitat conservation strategies for two Habitat Conservation Plans (pursuant to the Endangered Species Act) in north coastal California.

**Lee Benda, PhD ,Principal, Lee Benda & Associates.** Dr. Benda is a world-renowned geomorphologist with extensive knowledge of the forest landscape in California and the Pacific Northwest. In addition to analyzing effects of human land uses on environments, Dr. Benda also endeavors to place human disturbance within the context of natural disturbance, including storms, fires, and floods. This approach has led to a series of contributions in the watershed sciences with implications for resource management, conservation, regulation, and restoration. Benda has been a leader in the development of interdisciplinary analytical tools, like NetMap, that can be used to investigate the naturally dynamic behavior of watersheds and human's interaction within it. Dr. Benda has also pioneered the development of watershed analysis methods and has extensively studied the interaction of wood, sediment and streams.

**David Ganz, PhD.** David Ganz currently leads the work of the 19-person Global Fire Initiative, for The Nature Conservancy which is focused on abating fire-related threats to biodiversity around the world. Dr, Ganz is an expert in fire science, policy and management who also has experience integrating fire with some new and emerging conservation opportunities like sustainable livelihoods, climate change adaptation, ecosystem services, biofuels, avoided deforestation and community forestry. He has worked for United Nations' FAO at the Regional Community Forestry Center in Bangkok, Thailand and more recently, he was a senior scientist in charge of forestry and fire science projects for TSS Consultants and vice president of international operations for the Renewable Energy Institute. Recent projects have included organizing and facilitating both the China E5 Biofuels Assessment and the Pinchot Institute's independent science review of the Quincy Library Group pilot project

## Details of Technical Expert Forum

The TEF is single day meeting before the State Board of Forestry and Fire Protection to provide the Board advice on the findings from a scientific literature on forest management effects on salmonids. Central to the meeting are presentations to the Board from invited experts on their prospective on the literature review and its findings. It will also provide an opportunity for the public to voice their prospective and ask questions of the Sound Watershed Consulting (SWC), the contractors who conducted the literature review, and to the Technical Experts.

The TEF is intended to be a constructive discussion of science related to forest management effects on salmonids. Invited experts and the TAC will make presentations to the Board and engage in a "round table "discussion of questions.

I**ndividual Presentation:** Individual presentation from each invited expert will be targeted for a 15-minute duration and will include perspectives on:

- most relevant findings from the literature;
- strengths and weaknesses of the science reviewed in the literature review;
- areas of agreement/disagreements with the literature review findings;
- critical information and science gaps needed to highly meet board policy goals;
- personal perspective on other science or experience that would be important to the board in developing policy for protection of salmoinds during commercial timber harvesting operations (particularly in riparian zones).

The presentations will focus on science related to forest management effects on riparian function, and buffer zone characteristics, including width, composition, and equipment limitations needed for properly function riparian areas that support salmonids. The Board has a particular interest in focusing on spatial differences of buffer characteristics within a watershed and bioregionally (differences in buffer in the Sierras vs. coast for example), and buffer requirements for low order (headwater) streams.

While this literature review was focused on science related to characteristics of riparian buffers, there may be other important significant information that should be communicated to the Board regarding protection of salmonids that goes beyond riparian buffer characteristics. Experts are encouraged to communicate to the Board other relevant information or information gaps needed to addressed to highly meet the Board's policy goals of protection listed anadromous salmonid species during timber operations.

**Round Table Discussion:** Following individual presentations by science experts, an open discussion among experts is planned addressing prepared questions from the Board and public. This agenda item is called the "round table discussion". A facilitator will be available to help guide this process. The roundtable may also involve spontaneous questions from the Board and the public, depending on time and interest.

## Overview of Scientific Literature Review:

The California Forest Practice Rules related to protection of watersheds with anadromous salmonid species, termed the "Threatened or Impaired Watershed" rules (T/I rules), are under review by the State Board of Forestry and Fire Protection. The T/I rules are being reviewed for determining their adequacy in protecting the species, meeting the Forest Practice Act, and to establish permanent rules as the current rules expire on January 1, 2010.

The review process involves evaluating groups of similar rules against specific criteria, including current science literature. The FPC intends to complete the review by March 2009. Following the review the Board will begin any regulatory amendment procedures. Final adoption of any regulatory amendments would be completed by October 2009.

**Literature Review:** Information from current scientific literature on forest management effects on salmonids is an important part of the T/I rule review process because the Board intends to make its regulatory amendment decisions based on credible and current science. To facilitate the understanding of current scientific information, the Board is conducting a review of recent scientific literature on forest management effects on riparian areas that support anadromous salmonids.

The Board commissioned a highly-qualified consortium of contractors, Sound Watershed Consulting, to conduct a literature review .Sound Watershed Consulting is a team of professional scientists with proven experience in forest watershed science and management. The members of this team each have advanced degrees in watershed sciences and have provided technical support to forest management issues in a wide variety of jurisdictions throughout western North America and Southeast Asia.

The literature review will result in summaries of literature reviewed, answers to "Key Questions", and a synthesis of literature review findings. The Board will use these results to evaluate the existing rules and the effects of commercial timber operations on anadromous salmonids. The completed literature review can be viewed at: http://www.soundwatershed.com/BOF.htm

The literature review is focused on forest management effects on five different "Riparian Exchange Functions" that support anadromous salmonids in California. Use of the Riparian Exchange Function concept suggests that riparian areas support continuous ecosystems processes and function, and these functions change in response to biotic and abiotic inputs. While these functions are all connected processes in the riparian ecosystem, focusing on effects to specific functions provides a manageable format for review and analysis of scientific literature. The five Riparian Exchange Functions follow:

- Biotic and Nutrient
- Coarse Woody Debris
- Heat
- Sediment
- Water

The Board prioritized the literature review on the effects of forest management operations in riparian areas because of the many types of operations that can directly impact salmonids: tree harvesting in buffer strips, equipment encroachment, road crossings, buffer strip surface vegetation disturbance from site preparation or prescribed burning,

riparian restoration, and water drafting. Additionally, the existing T/I rules have substantive prescriptive requirements for riparian zone operations and ensuring the rules adequately protect the species, are enforceable and do not unreasonably burden landowners is a primary goal for the rule review.

Although the literature review focuses on forest management effects directly associated with or occurring in riparian areas, the Board recognizes the need for reviewing other literature that informs on forest management effects on salmonids. Literature that addresses upland harvesting, cumulative effects, monitoring, geologic stability, and forest roads are all pertinent for this rule review. While literature on these factors would provide valuable information for protection of salmonid species, the extensive breathe of literature needed for these topics are currently beyond the financial capacity of the Board.

**Technical Advisory Committee:** The Board has appointed a Technical Advisory Committee (TAC) to serve as scientific advisors during the literature review and its presentation to the Board. The TAC's primary charge was to organize the literature review, ensure the literature review is adequately completed, and advise the Board on its findings. Specific actions by the TAC include recommendations for the development of the contract specifications, development of "Key Questions" intended to be answered by the review, preparation of the initial list of literature to be reviewed, and development of background "Primers" for each riparian function. The background Primers http://www.fire.ca.gov/CDFBOFDB/pdfs/RPF_Appendix_040708_finalwithfooter.pdf are a compilation of past literature (per 1996) and establish a baseline of well agreed upon, past science information. The TAC works through the Board Contract Representative to provide this technical assistance and oversee successful completion of the literature review.